

Amendments to the Claims

1 Claim 1 (currently amended): A computer-implemented method of managing ~~at least one a~~
2 collaborative process performed in accordance with a first entity and at least a second entity, the
3 method comprising ~~the steps of:~~

4 a computer obtaining information associated with the ~~at least one~~ collaborative process
5 used to design and develop a given product; and

6 based on at least a portion of the obtained information, the computer dynamically building
7 and maintaining an information structure ~~in the form of~~ as a context pyramid structure
8 ~~representative of the collaborative process so as to assist at least one of the first entity and the~~
9 second entity in managing at least a portion of the collaborative process;

10 wherein the context pyramid structure ~~provides a representation of the~~ represents a status
11 of the collaborative process ~~including one or more global and local tasks, and comprises results of~~
12 ~~a time offset calculation, a checkpoint calculation and a potential energy level calculation for the~~
13 ~~one or more global and local tasks involved in the collaborative process~~ using a plurality of flow
14 lines that represent a plurality of levels of resolution of tasks in the collaborative process; and

15 wherein the building and maintaining comprises:

16 creating a lowest-level flow line to represent a lowest-level of resolution, the
17 lowest-level flow line corresponding to a timeline for completing the collaborative process, the
18 timeline containing a plurality of checkpoints for completing the collaborative process, each of the
19 checkpoints represented on the lowest-level flow line by a node, the nodes comprising at least a
20 starting node representing a starting checkpoint on the timeline and an ending node representing
21 an ending checkpoint on the timeline; and

22 iteratively creating at least one next-higher level flow line to represent a next-
23 higher level of resolution from a next-lower level flow line, for at least one pair of consecutive
24 nodes on the flow line of the next-lower level, the next-higher level flow line corresponding to a
25 next-higher-resolution timeline containing a plurality of higher-resolution checkpoints for
26 completing a portion of the collaborative process that occurs between the checkpoints represented
27 by the consecutive nodes on the lower-level flow line, each of the higher-resolution checkpoints
28 represented on the next-higher level flow line by a node, the nodes on the next-higher level flow
29 line comprising at least a starting node representing a starting checkpoint on the next-higher-
30 resolution timeline and an ending node representing an ending checkpoint on the next-higher-
31 resolution timeline.

1 Claim 2 (currently amended): The method of claim 1, further comprising ~~the step of~~
2 incorporating annotated business data into the information structure.

1 Claim 3 (currently amended): The method of claim 1, further comprising ~~the step of~~
2 incorporating annotated design data into the information structure.

1 Claim 4 (currently amended): The method of claim 1, further comprising ~~the step of~~ controlling
2 data flow associated with the at least one collaborative process based on the information
3 structure.

1 Claim 5 (currently amended): The method of claim 1, further comprising ~~the step of~~ fetching one

2 or more design data features for at least one of monitoring and tracking the ~~at least one~~
3 collaborative process using the context pyramid structure.

1 Claim 6 (original): The method of claim 1, wherein the at least one collaborative process is a
2 business process.

1 Claim 7 (original): The method of claim 1, wherein the at least one collaborative process is an
2 engineering design process.

Claim 8 (canceled)

1 Claim 9 (original): The method of claim 1, wherein the information structure is multi-
2 dimensional.

1 Claim 10 (original): The method of claim 1, wherein the information structure is multi-resolution.

1 Claim 11 (original): The method of claim 1, wherein the obtained information comprises
2 annotated data.

1 Claim 12 (original): The method of claim 1, wherein the obtained information comprises user
2 input.

Claims 13 - 14 (canceled)

1 Claim 15 (currently amended): The method of claim 1, further comprising ~~the step of~~ analyzing at
2 least one of the obtained information and the information structure.

1 Claim 16 (currently amended): The method of claim 15, further comprising ~~the step of~~ generating
2 one or more action representations based on the analyzing ~~[[step]]~~.

1 Claim 17 (currently amended): The method of claim 16, wherein the analyzing ~~[[step]]~~ is rule-
2 based.

1 Claim 18 (currently amended): Apparatus for managing a ~~at least one~~ collaborative process
2 performed in accordance with a first entity and at least a second entity, the apparatus comprising:
3 a memory; and
4 at least one processor coupled to the memory and operative to: ~~[[i)]]~~ obtain information
5 associated with the ~~at least one~~ collaborative process used to design and develop a given product;
6 and ~~[[ii)]]~~ based on at least a portion of the obtained information, dynamically build and maintain
7 an information structure ~~in the form of~~ as a context pyramid structure ~~representative of the~~
8 ~~collaborative process so as~~ to assist at least one of the first entity and the second entity in
9 managing at least a portion of the collaborative process, wherein:
10 the context pyramid structure ~~provides a representation of the~~ represents a status
11 of the collaborative process ~~including one or more global and local tasks, and comprises results of~~

~~a time offset calculation, a checkpoint calculation and a potential energy level calculation for the~~
~~one or more global and local tasks involved in the collaborative process using a plurality of flow~~
~~lines that represent a plurality of levels of resolution of tasks in the collaborative process; and~~
~~the building and maintaining comprises:~~
~~creating a lowest-level flow line to represent a lowest-level of resolution,~~
~~the lowest-level flow line corresponding to a timeline for completing the collaborative process, the~~
~~timeline containing a plurality of checkpoints for completing the collaborative process, each of the~~
~~checkpoints represented on the lowest-level flow line by a node, the nodes comprising at least a~~
~~starting node representing a starting checkpoint on the timeline and an ending node representing~~
~~an ending checkpoint on the timeline; and~~
~~iteratively creating at least one next-higher level flow line to represent a next-~~
~~higher level of resolution from a next-lower level flow line, for at least one pair of consecutive~~
~~nodes on the flow line of the next-lower level, the next-higher level flow line corresponding to a~~
~~next-higher-resolution timeline containing a plurality of higher-resolution checkpoints for~~
~~completing a portion of the collaborative process that occurs between the checkpoints represented~~
~~by the consecutive nodes on the lower-level flow line, each of the higher-resolution checkpoints~~
~~represented on the next-higher level flow line by a node, the nodes on the next-higher level flow~~
~~line comprising at least a starting node representing a starting checkpoint on the next-higher-~~
~~resolution timeline and an ending node representing an ending checkpoint on the next-higher-~~
~~resolution timeline.~~

Claim 19 (currently amended): An article of manufacture for managing a ~~at least one~~

collaborative process performed in accordance with a first entity and at least a second entity,
comprising a computer readable storage medium containing one or more programs which when
executed implement ~~the steps of:~~

obtaining information associated with the ~~at least one~~ collaborative process used to design
and develop a given product; and

based on at least a portion of the obtained information, dynamically building and
maintaining an information structure ~~in the form of~~ as a context pyramid structure ~~representative~~
~~of the collaborative process so as~~ to assist at least one of the first entity and the second entity in
managing at least a portion of the collaborative process;

wherein the context pyramid structure ~~provides a representation of the~~ represents a status
of the collaborative process ~~including one or more global and local tasks, and comprises results of~~
~~a time offset calculation, a checkpoint calculation and a potential energy level calculation for the~~
~~one or more global and local tasks involved in the collaborative process~~ using a plurality of flow
lines that represent a plurality of levels of resolution of tasks in the collaborative process; and

wherein the building and maintaining comprises:

creating a lowest-level flow line to represent a lowest-level of resolution, the
lowest-level flow line corresponding to a timeline for completing the collaborative process, the
timeline containing a plurality of checkpoints for completing the collaborative process, each of the
checkpoints represented on the lowest-level flow line by a node, the nodes comprising at least a
starting node representing a starting checkpoint on the timeline and an ending node representing
an ending checkpoint on the timeline; and

iteratively creating at least one next-higher level flow line to represent a next-

24 higher level of resolution from a next-lower level flow line, for at least one pair of consecutive
25 nodes on the flow line of the next-lower level, the next-higher level flow line corresponding to a
26 next-higher-resolution timeline containing a plurality of higher-resolution checkpoints for
27 completing a portion of the collaborative process that occurs between the checkpoints represented
28 by the consecutive nodes on the lower-level flow line, each of the higher-resolution checkpoints
29 represented on the next-higher level flow line by a node, the nodes on the next-higher level flow
30 line comprising at least a starting node representing a starting checkpoint on the next-higher-
31 resolution timeline and an ending node representing an ending checkpoint on the next-higher-
32 resolution timeline.

Claim 20 (canceled)

1 Claim 21 (new): The method of claim 1, wherein the building further comprises:

2 adding a virtual node beneath the lowest-level flow line;

3 adding, to the flow line for each of the levels above the lowest-level flow line, a starting
4 node corresponding to the starting node of the lowest-level flow line and an ending node
5 corresponding to the ending node of the lowest-level flow line; and

6 forming the context pyramid structure from the plurality of flow lines by connecting the
7 virtual node to the starting node of the highest of the levels with a first vector and connecting the
8 virtual node to the ending node of the highest of the levels with a second vector and then
9 compressing all of the flow lines to cause the starting nodes to be placed on the first vector and
10 the ending nodes to be placed on the second vector.

1 Claim 22 (new): The method of claim 1, wherein the maintaining further comprises performing a
2 checkpoint calculation for at least one of the levels of resolution of tasks in the collaborative
3 process, when any of the checkpoints represented by the nodes on the flow line is missed,
4 comprising recomputing a time offset for each successive one of the checkpoints on the flow line
5 and adjusting the node that represents the successive one on the flow line.

1 Claim 23 (new): The apparatus of claim 18, wherein the building further comprises:

2 adding a virtual node beneath the lowest-level flow line;

3 adding, to the flow line for each of the levels above the lowest-level flow line, a starting
4 node corresponding to the starting node of the lowest-level flow line and an ending node
5 corresponding to the ending node of the lowest-level flow line; and

6 forming the context pyramid structure from the plurality of flow lines by connecting the
7 virtual node to the starting node of the highest of the levels with a first vector and connecting the
8 virtual node to the ending node of the highest of the levels with a second vector and then
9 compressing all of the flow lines to cause the starting nodes to be placed on the first vector and
10 the ending nodes to be placed on the second vector.

1 Claim 24 (new): The article of manufacture of claim 19, wherein the building further comprises:

2 adding a virtual node beneath the lowest-level flow line;

3 adding, to the flow line for each of the levels above the lowest-level flow line, a starting
4 node corresponding to the starting node of the lowest-level flow line and an ending node

5 corresponding to the ending node of the lowest-level flow line; and
6 forming the context pyramid structure from the plurality of flow lines by connecting the
7 virtual node to the starting node of the highest of the levels with a first vector and connecting the
8 virtual node to the ending node of the highest of the levels with a second vector and then
9 compressing all of the flow lines to cause the starting nodes to be placed on the first vector and
10 the ending nodes to be placed on the second vector.